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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/618,049	07/11/2003	Peter Mardilovich	200300109-1	5611

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EXAMINER	
BAREFORD, KATHERINE A	
ART UNIT	PAPER NUMBER
1792	

NOTIFICATION DATE	DELIVERY MODE
02/15/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/618,049	MARDILOVICH ET AL.	
	Examiner	Art Unit	
	Katherine A. Bareford	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 January 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,14,15 and 18-30* is/are pending in the application.

4a) Of the above claim(s) *21-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,14,15 and 18-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 23, 2007 has been entered.

The amendment of January 10, 2008 (in response to the Notice of Non-compliant Amendment of December 12, 2007) has been received and entered. With the entry of the amendment, claims 13, 16 and 17 have been canceled, claims 21-30 remain withdrawn from consideration, and claims 1-12, 14, 15 and 18-20 are pending for examination.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19, lines 1-2, after the amendment of January 10, 2008, now reads ". . . the step of ink-jetting further includes the step of marring the substrate along the pattern", and is unclear as to which ink-jetting step is referred to, as parent claim 1 has three different ink-jetting steps.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-4, 6-12, 14, 15, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson (US 6120588) in view of McCormack (US 4301196).

Jacobson teaches a method of forming metal patterns on a substrate. Column 9, lines 15-30. A pattern is decided for application. Column 9, lines 15-30. A metal composition is ink-jetted in the pattern. Figure 9A and column 9, line 60 through column 10, line 10 (the silver nitrate). A separate reducing agent composition with a reducing agent is also ink jetted in the pattern. Figure 9A and column 9, line 60 through column 10, line 10 (the aldehyde). The reducing agent contacts the metal composition and reacts with the metal salt to form a reduced metal. Figure 9A and column 9, line 60 through column 10, line 10 (by the process of "electroless plating"). While Jacobson describes silver nitrate plating, the reference teaches that many other chemistries known in the art of electroless plating can be used. Column 10, lines 1-5.

Claim 2: the metal can be silver, etc. Figure 9A and column 9, line 60 through column 10, line 10 (the silver nitrate).

Claim 4: the salt can be $AgNO_3$. Column 10, line 1.

Claim 6: the reducing agent can include aldehyde. Figure 9A and column 9, line 60 through column 10, line 10 (the aldehyde).

Claim 12: the reducing agent is ink jetted on the pattern in a offset area with respect to the metal composition. Figure 9A. A portion of each material would not overlap each other due to the offset nature of their sprays.

Jacobson teaches all the features of these claims except (1) the electroless active layer and that it is applied by ink jetting an electroless initiator (claim 1), (2) the specific reducing agent (claims 6-7), (3) the specific substrate (claim 8), (4) the heating (claim 9), (5) the multiple layers and depth (claims 10-11), (6) the initiator features (claims 14, 15, 18), (7) the circuit pattern (claim 20) and (8) that the metal composition includes a metal salt of palladium (claim 3).

However, McCormack teaches a method of applying an electroless copper plating. Column 3, lines 60-68. The surface can be pretreated with an initiator treatment, such as by depositing an electroless initiator of palladium and tin, to provide an electroless active layer. Column 6, line 50 through column 7, line 5. The pretreatment can be by immersing the substrate the initiator. Column 7, lines 1-5. The plating can use a composition with metal and reducing agent of formaldehyde or hydrazines, which is applied to the pretreated electroless active layer. Column 3, lines 60-65, column 5, lines 40-50 and column 6, lines 50-65. The substrate can be ceramics, glass, polymers, etc. Column 7, lines 30-35. During treating the temperature can be 20-80 degrees C. Column 7, lines 20-30. The coating is to be applied until a desired thickness has been built up. Column 7, lines 5-10. McCormack teaches that the plating can be used to apply circuit patterns. Column 1, lines 25-50. The plating composition can be applied by immersion or spraying. Column 7, lines 5-10. The plating composition can include various metals from Group VIII of the periodic table including palladium provided as a metal salt, thus providing a metal salt of palladium would be

applied on the substrate as part of the metal application. column 4, line 67 through column 5, line 10 and column 14, lines 20-55 (see the use of palladium chloride in the table).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jacobson to use the conventional electroless plating features and materials taught by McCormack in the inkjet electroless plating process with an expectation of a desirable plated article being achieved, because Jacobson teaches a method of inkjet electroless plating that can be used with conventional electroless plating chemistry and McCormack teaches conventional electroless plating chemistry, including the use of an initiator layer of electroless active material, conventional reducing agents such as hydrazines, specific substrate materials, such as ceramics, specific materials desired to be plated, including palladium, the conventional heating of the compositions during application, the conventional materials and application of the initiator layer and the conventional deposition of the material to form circuit patterns. As to the multiple applications to form layers of the desired depth, it would have been obvious to one of ordinary skill in the art to do so, given McCormack's teaching to provide the treatment until the desired depth has been reached, and one of ordinary skill in the art would optimize the depth based on the desired purpose of the coating to be applied. It further would have been obvious to deposit the electroless initiator by ink jetting in a non-continuous pattern to correspond to the overlaying metal pattern to be applied so that the minimum amount of initiator

material can be used, because as demonstrated by Jacobson, it is well known to use ink jet applicators to apply metal containing compositions onto a substrate in patterns for plating surfaces, and one would expect predictable patterning application results from using ink jet applicators with the known metal containing initiator composition of McCormack

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson in view of McCormack as applied to claims 1-4, 6-12, 14, 15, 18 and 20above, and further in view of Japan 08-319575 (hereinafter '575).

Jacobson in view of McCormack teaches all the features of this claim except what palladium salt can be used.

However, '575 teaches that $Pd(NH_3)_4Cl_2$ can be used as the metal salt for an electroless deposition. Abstract.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jacobson in view of McCormack to use $Pd(NH_3)_4Cl_2$ as the palladium salt when depositing palladium as suggested by '575 in order to provide a desirable palladium coating, because Jacobson in view of McCormack teaches electroless coating using conventional materials, and that palladium salts can be used, and '575 teaches that $Pd(NH_3)_4Cl_2$ is a desirable metal salt for electrolessly depositing palladium.

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson in view of McCormack as applied to claims 1-4, 6-12, 14, 15, 18 and 20 above, and further in view of Wells (US 3918927).

Jacobson in view of McCormack teaches all the features of this claim except the marring of the substrate.

However, Wells teaches that the application of activator solution of palladium chloride is performed in acidic environments. Column 11, lines 54-57. Wells also teaches that it is well known to prepare a surface for electroless coating by marring the surface by the etching with acid before coating. See column 3, lines 25-35 and 65-66 and column 11, lines 40-45.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jacobson in view of McCormack to mar the substrate by etching from acid as suggested by Wells in order to provide a desirable electroless coating, because Jacobson in view of McCormack teaches that an initiator coating with palladium can be applied and Wells teaches that when applying such a coating it is known to provide it in an acid environment which would further provide marring by etching from the acid (as part of the application of the initiator) and also teaches to further prepare the surface by etching with acid.

9. Claims 1-4, 6-12, 14, 15, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson (US 6120588) in view of McCormack (US 4301196) and Morgan et al (US 5403649).

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applied on the substrate as part of the metal application. column 4, line 67 through column 5, line 10 and column 14, lines 20-55 (see the use of palladium chloride in the table).

Morgan teaches that it is well known to provide catalytic inks (which act as an "initator" or "active" layer for electroless platings as they allow electroless plating on a non-conductive surface) that are printed in patterns on surfaces to be electrolessly plated. Column 1, lines 15-45. The inks conventionally contain a metal for catalyzing electroless deposition, such as silver, copper or palladium, in the form of dissolved salts, hydrosols or particulates. Column 1, lines 15-35. The inks can applied by ink-jetting using palladium salt in an organic solvent. column1 1, lines 30-45.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jacobson to use the conventional electroless plating features and materials taught by McCormack in the inkjet electroless plating process with an expectation of a desirable plated article being achieved, because Jacobson teaches a method of inkjet electroless plating that can be used with conventional electroless plating chemistry and McCormack teaches conventional electroless plating chemistry, including the use of an initiator layer of electroless active material, conventional reducing agents such as hydrazines, specific substrate materials, such as ceramics, specific materials desired to be plated, including palladium, the conventional heating of the compositions during application, the conventional materials and application of the initiator layer and the conventional deposition of the material to form

circuit patterns. As to the multiple applications to form layers of the desired depth, it would have been obvious to one of ordinary skill in the art to do so, given McCormack's teaching to provide the treatment until the desired depth has been reached, and one of ordinary skill in the art would optimize the depth based on the desired purpose of the coating to be applied. It further would have been obvious to modify Jacobson in view of McCormack to deposit the electroless initiator by ink jetting in a non-continuous pattern to correspond to the overlaying metal pattern to be applied as suggested by Morgan so that the minimum amount of initiator material can be used, because as demonstrated by Jacobson, it is well known to use ink jet applicators to apply metal containing compositions onto a substrate in patterns for plating surfaces, as demonstrated by McCormack, it is desirable to apply initiator/activator layer materials before electroless plating, and as demonstrated by Morgan, it is well known to use ink jet applicators to apply metal containing catalyst activating inks in patterns before electrolessly plating.

10. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson in view of McCormack and Morgan as applied to claims 1-4, 6-12, 14, 15, 18 and 20above, and further in view of Japan 08-319575 (hereinafter '575).

Jacobson in view of McCormack and Morgan teaches all the features of this claim except what palladium salt can be used.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jacobson in view of McCormack and Morgan to use $Pd(NH_3)_4Cl_2$ as the palladium salt when depositing palladium as suggested by '575 in order to provide a desirable palladium coating, because Jacobson in view of McCormack and Morgan teaches electroless coating using conventional materials, and that palladium salts can be used, and '575 teaches that $Pd(NH_3)_4Cl_2$ is a desirable metal salt for electrolessly depositing palladium.

11. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobson in view of McCormack and Morgan as applied to claims 1-4, 6-12, 14, 15, 18 and 20 above, and further in view of Wells (US 3918927).

Jacobson in view of McCormack and Morgan teaches all the features of this claim except the marring of the substrate.

However, Wells teaches that the application of activator solution of palladium chloride is performed in acidic environments. Column 11, lines 54-57. Wells also teaches that it is well known to prepare a surface for electroless coating by marring the surface by the etching with acid before coating. See column 3, lines 25-35 and 65-66 and column 11, lines 40-45.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Jacobson in view of McCormack and Morgan to mar the substrate by etching from acid as suggested by Wells in order to provide a desirable electroless coating, because Jacobson in view of McCormack and Morgan teaches that an initiator coating with palladium can be applied and Wells teaches that when applying such a coating it is known to provide it in an acid environment which would further provide marring by etching from the acid (as part of the application of the initiator) and also teaches to further prepare the surface by etching with acid.

Response to Arguments

12. Applicant's arguments filed January 10, 2008 have been fully considered but they are not persuasive.

(A) As to the 35 USC rejection using Jacobson in view of McCormack, applicant argues that none of the references teach the step of forming an electroless active layer by ink jetting an electroless initiator, with Jacobson not teaching an electroless active layer, and while McCormack allegedly teaches an electroless active layer, it has no teaching regarding ink-jetting, and the combination does not teach forming an electroless active layer by ink-jetting (and none of the other references cures this defect). Applicant further argues that while the Examiner takes the position that since Jacobson teaches ink-jetting and McCormack teaches an electroless active layer, the combination provides the elements of the pending claims, this argument infers that since an ink-jetting

reference teaches ink-jetting, therefore, anything that is ink-jetted would be obvious. However, according to applicant, a prima facie case of obviousness has not been met, even if the present combination could lead on skilled in the art to ink-jet metal traces on a sensitized substrate, the present combination does not teach the step of ink-jetting an electroless active layer. Applicant argues that the Examiner has used impressible hindsight to reconstruct the present invention. Applicant also notes that for Wells, it does not teach specific marring of the substrate.

The Examiner has reviewed these arguments, however, the rejection is maintained. While neither Jacobson alone or McCormack alone specifically teach that the electroless active layer should be applied by ink jetting, the combination of these references provides the suggestion to one of ordinary skill in the art to provide the electroless active layer by ink jetting. This is because Jacobson teaches the beneficial application of an electroless plating by ink jetting a pattern of metal containing composition, and McCormack teaches the desirable application of an electroless active layer of electroless initiator prior to application of an electroless plating. It would have been obvious to one of ordinary skill in the art to modify Jacobson to use a electroless active layer before the electroless plating as suggested by McCormack for the beneficial plating results provided by using such an electroless active layer in the electroless plating art. Furthermore, it would further have been obvious to one of ordinary skill in the art looking at the teachings of both references as a whole to also deposit the electroless initiator for the electroless active layer by ink jetting a pattern of the initiator

to correspond to the metal pattern by be applied by electroless plating, for the beneficial purpose of minimizing the amount of initiator material to be used. This is because Jacobson demonstrates the known use of ink jet applicators to provide patterns of metal containing composition onto a surface for plating, and one would expect predictable patterning application results from using these known ink jet applicators with the known metal containing initiator composition of McCormack, since McCormack would require application of the compositions for the process to work. The Examiner is not taking the position that any material in the world would be ink jetted or suggested to be ink jetted by the teaching of Jacobson, rather that a similar liquid as described by McCormack (both Jacobson and McCormack describe the use of metal containing compositions in the form of salts -- Jacobson, column 9, line 60 through column 10, line 5; McCormack, column 6, lines 60-65, column 7, lines 1-5). In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Here the reasoning as to why the knowledge would be within the level of ordinary skill in the art at the time the invention was made has been discussed above. As to the use of Wells for marring the

substrate, the Examiner noted that the catalyst itself is acidic (note column 11, lines 54-57 (note the use of HCl)), which would be expected to have some etching effect. The removal of tin salts is by a later acid salt accelerator solution. column 11, lines 55-60.

(B) To further clarify the rejection, the Examiner has also provided a new 35 USC 103 rejection using Jacobson in view of McCormack and Morgan; with Morgan further demonstrating the known use of ink-jetting to provide patterned application of catalyst activating material in the form of metal salts prior to electroless plating.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine A. Bareford/
Primary Examiner, Art Unit 1792